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Title : CASCADE TESTS ON CE 20 LOX TURBINE STATOR BLADE PROFILE

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Abstract : LPSC, ISRO as part of their CE 20 cryogenic engine development program, desired to get the liquid oxygen [LOX] turbo pump turbine profiles tested in the NAL Transonic Cascade Tunnel to obtain basic aerodynamic performance data. The LOX turbine consists of a nozzle, first rotor, stator and second rotor. The cascade tests on the first rotor profile were completed first on priority. Similar profiles have been designed for first rotor, stator and second rotor with minor changes in stagger angle and pitch. Hence, the same cascade blades, which were used to test the first rotor configuration, were deployed at pitch and stagger corresponding to the stator to test the equivalent configuration. The LOX stator configuration was tested at three different inlet flow angles and six outlet Mach numbers. Performance parameters such as profile loss, exit flow angle, flow velocities and surface Mach number distribution were evaluated. The test details and results of the LOX stator configuration are elaborated in this report.